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Behavior of Free-ranging Chimpanzees, Tanzania, 1968

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Grant Nos. 670, 737: In support of the ninth year of an intensive long-term study of chimpanzees in the wild conducted at the Gombe National Park, Tanzania.

In 1960 I initiated a study of the behavior of the long-haired, or eastern, chimpanzee *(Pan troglodytes schweinfurthi)* in the Gombe Stream Chimpanzee Reserve (which in 1968 was constituted as the Gombe National Park). This park consists of a strip of very mountainous forested country stretching for about 10 miles along the east shores of Lake Tanganyika and running inland 1 to 3 miles to the tops of the mountains of the Rift Escarpment.

The aim of the study is to discover as much as possible about the ecology and social behavior of the small semi-isolated population of chimpanzees (probably numbering between 100 and 150) inhabiting the area. During the early years of the study I roamed the mountains daily making notes on chimpanzee behavior. In 1962 one mature male chimpanzee visited my camp and was given bananas. The following year, when other chimpanzees had followed his lead to my camp, I decided to establish an artificial feeding area; whenever these chimpanzees were in the neighborhood they visited my camp for bananas (see van Lawick-Goodall, 1968). This meant that it became possible, for the first time, to make consecutive observations on some of the different individuals of the nomadic community.

During 1968 our team of research assistants and students (working on their own doctoral projects) expanded considerably. Students with B.A. or B.Sc. degrees serving as my assistants in maintaining the general long-term records on known individual chimpanzees were Geza Teleki, Miss Carole Gale, and Miss Ruth Davis. Toward the end of the year Mr. Teleki and Miss Gale left the Centre (Mr. Teleki to write up chimpanzee predatory behavior for an M.A. thesis) and were succeeded by John Gibbons and Miss Cathleen Clarke. During the year two research students worked on their Ph.D

projects with National Geographic Society support. They were Miss Alice Sorem (infant development) and Patrick McGinnis (reproductive behavior). Both had previously worked for one year as research assistants at Gombe. In addition, Mr. and Mrs. Timothy Ransom, from the University of California at Berkeley and financed independently, studied the behavior of baboons *(Papio annubis)* in the Gombe National Park. We employed Mr. and Mrs. N. Pickford to act as an administration/technician team, necessitated by the increase in personnel, which laid a very heavy administrative load on the students when Hugo van Lawick and I were away from Gombe.

Owing to the greater numbers of students working at Gombe our previous facilities were inadequate, and we were grateful to the Society for granting us funds to increase and improve existing buildings.

Prof. Robert A. Hinde of Cambridge University and Prof. David A. Hamburg of Stanford University visited Gombe during 1968 and rendered invaluable advice on data collection and analysis.

Research Results

During 1968 records were maintained on the development and behavior of some 40 known individual chimpanzees. The animals were observed at the artificial feeding area; also they were followed, by students, when they left the feeding area and moved off into the forest. Gradually more and more of the chimpanzees became tolerant of human observers moving quite closely behind them as they traveled through the park from one food source to another.

In the early part of 1968 the situation at the artificial feeding area gradually worsened. At the time the chimpanzees were being fed bananas on irregular days, since during the previous year it had become obvious that regular feeding was having serious effects on their normal grouping and ranging behavior. They had begun to remain for days at a time in the approximate area of the feeding station; they moved about in larger groups than previously; they frequently nested close to the feeding station and arrived very early in the morning; and, worst of all, aggressive behavior was increasing continually. Moreover, this aggression was increasingly involving the members of two different troops of baboons, both troops spending part of each day hanging around the area of the feeding station. If we tried to feed the chimpanzees bananas the baboons hurried to the scene and severe cases of inter- as well as intraspecies conflict invariably took place.

For a short while the change to irregular days for feeding was beneficial, but gradually the situation worsened again. Moreover, since the baboon troops were being studied they were becoming increasingly less afraid of

people, and during tense situations at the feeding area it was not uncommon for adult male baboons to redirect their aggression onto human observers.

During July, when Hugo van Lawick and I returned to the Gombe after an absence, the situation at the feeding area was so bad that it was necessary to take immediate action. We discontinued feeding completely for over a week, during which time the baboons gradually moved farther from the feeding area each day. Subsequently we began feeding the chimpanzees again, but far less frequently, and never until the baboon troops had passed through the feeding area and were a good distance away. In this respect we were much indebted to the Ransoms for their cooperation in keeping us informed in detail of the movements of the two baboon troops involved.

As a result of the much decreased frequency of feeding, the behavior of the chimpanzees gradually reverted to more normal patterns; group size once more correlated approximately to the average group size I had record-

FIG. 1. Group of chimpanzees feeding on the flesh of a red colobus monkey (*Colobus badius*), which they have caught. The carcass is in the possession of the dominant male of the community, Mike. The old female Flo is begging from Mike, holding her hand to his lips. Eventually he will spit a wad of leaves and chewed meat into her hand. The young adult male Charlie, on the right, has his hands on part of the carcass.

ed before the start of banana feeding; the chimpanzees ranged farther afield more and more frequently; and, finally, aggressive incidents at the observation area dropped off dramatically. The introduction of artificial feeding into the chimpanzee community actually turned out to be a fascinating (though unplanned) field experiment, the results of which are presently being prepared for publication.

Chimpanzee predation. We made a number of further detailed observations on hunting and meat-eating behavior during the year. No less than 10 young baboons and 1 colobus monkey were caught and eaten during the year, in addition to which research personnel observed the chimpanzees make 13 additional attempts to capture baboons.

Twice the actual moment of seizure was observed. On one occasion the dominant male chimpanzee, Mike, grabbed an infant baboon from its mother during a charging display and flailed it against the ground. Another time a young adult male chimpanzee was observed climbing up a palm tree in which a mature male baboon was feeding with a black infant cradled in his lap. Suddenly the chimpanzee made a lightning lunge toward the baboons, grabbed the infant, and in the same instant leapt away and slid down a frond and to the ground. The male baboon followed but was not able to rescue the victim. On a third occasion several male chimpanzees repeatedly stood up to stare toward a baboon infant that kept calling out during a weaning tantrum. Finally the chimpanzees ran toward the infant. This time, however, the infant was seized and rescued by the same male baboon that had lost the infant on the previous occasion. However, when the chimpanzees finally emerged from the grass they had managed to catch a juvenile baboon. Normally the chimpanzees kill their victims quickly; this time the unfortunate young one was eaten alive. It died approximately 30 minutes after being caught.

Many of the instances when hunting techniques failed involved very deliberate and sometimes prolonged stalking behavior on the part of the chimpanzees. On three occasions the same young male (Figan) crept silently and slowly up a tree in which a young baboon was feeding on its own (separated by more than 50 yards from its troop) while other male chimpanzees spread out on the ground below—at the base of the tree in question and also the bases of neighboring trees, which could have served as escape routes for the intended prey. On each of these occasions, however, the baboon managed to leap to freedom.

Of particular interest was the lack of efficient defense mechanisms in the baboon troops. Baboons in other areas have been known to drive off (and even kill) leopards hunting a troop member; lions have also been

FIG. 2. Another part of the same meat-eating sequence. Here the young male Charlie, on the left, shows a full open grin in response to a slight threat from the dominant male Mike. The old female Flo, to the far right, has drawn back her hand from the carcass. To Flo's right is the young adult male Faben, Flo's eldest-known offspring. He shows a slight pout as he looks at the flesh. Between Charlie and Fifi is Flo's adolescent daughter, Fifi. Fifi is taking meat from the carcass. Mike ignores this except to place one foot on the meat. Fifi is in estrus; at such times females are usually able to share meat.

driven away by adult male baboons. But in our area the male baboons have not so far been observed to inflict wounds on hunting chimpanzees. They have normally hurried to the scene in response to the screaming of a victim, or a potential victim, but confined their defensive behavior to lunging toward the chimpanzees and "roaring." Even a male baboon that actually leapt onto the back of a chimpanzee during such harassment incidents was not seen to attempt to bite or to inflict damage of any sort. Harassment techniques were often successful when baboons arrived on the scene before a capture had been made but so far have not been effective in the rescue of a conspecific once it has been actually caught.

Infant development and family relationships. Miss Sorem's study of infant development has yielded a wealth of detailed information on the physical and psychological development of nine infants of different ages. It is becoming

increasingly apparent that differences in maternal behavior are likely to have a profound effect on the subsequent behavior of the youngster as it grows up. However, many more years of observation of the individuals now being studied as infants will be necessary before we can be certain of this.

Particularly detailed records were obtained on the early development of one infant, a female (Flame) born to the old mother Flo. Hoping to observe parturition, Miss Sorem followed Flo almost continuously for 16 days before the birth of the infant. Unfortunately, however, when Miss Sorem arrived at the tree before dawn on the day of the baby's birth, the mother Flo was not in the nest where she had been left at nightfall. When Flo was next seen, at 9:30 a.m., the infant was already dry.

Flo did not detach the placenta, and for several hours that morning the umbilical cord was wrapped twice around the infant's waist. Subsequently, after the cord had become untwisted, Flo once dropped the placenta as she jumped from one branch to another. Had the cord been twisted around the infant's neck at the time she might have been strangled. When the infant was 2 days old Flo was chased by an adult male through a tangle of branches; had she dropped the placenta at this time her baby could have been jerked away. This was the third instance observed that a wild chimpanzee mother did not detach the placenta from her neonate, nor have we ever seen a mother perform this action at Gombe. In captivity, where countless births have been recorded, it appears to be the exception rather than the rule for the mother to bite through the umbilical cord. In view of the obvious danger to the newborn chimpanzee posed by an attached placenta, it is difficult to explain the fact that most chimpanzee mothers neither detach nor eat the placenta —maternal behavior patterns that appear to be genetically coded in the majority of mammals.

We estimate that the gestation period was 129 ± 2 days. Throughout Flo's pregnancy her previous infant, Flint, continued to ride about on his mother's back and share her nest at night. In addition, he continued to nurse during the first 5 months of the gestation period. Flo had first started to try to wean Flint in mid-1966. During the early part of 1968 Flo was observed to reject Flint more frequently and more vigorously whenever he approached to try to nurse. Always, though, after Flint had persisted in his attempts (often he had thrown weaning tantrums) Flo had given in and permitted his access to her breast. A couple of months before the birth of the new infant it appeared that Flo's milk had finally dried up, and at this time Flint had reverted to infantile behavior patterns, clinging to Flo's back or belly during many of their travels and flying into tantrums if she tried to prevent him from doing so. In addition, he constantly pestered her to groom him; when

she lay down to rest Flint started to whimper, pushed at Flo, or pulled her hands toward him, whimpering more and more loudly, until finally she usually sat up and began to groom.

After the birth of the new infant, and contrary to expectations, Flint abandoned many of these behaviors. He was fascinated by his new sibling and constantly reached out to try to touch her. At first Flo repeatedly pushed his hand away, and on a few occasions Flint used a stick as an investigation probe, gently touching the infant with one end, which he then sniffed very intently. Flint no longer tried to ride on Flo's back when the family traveled through the forest (except occasionally, for a few yards, if he was suddenly alarmed). Nor did Flint pester his mother so frequently for social grooming. He did, however, persist in sharing his mother's nest at night; if she tried to reject him he flew into a tantrum, after which, when he approached again, Flo normally allowed him to join her and his sibling in the nest.

During 1968 two chimpanzee mothers died during an epidemic of a flulike disease. Circe's infant was 3 years old at the time and survived her mother by only 2 months. During this time she developed many of the symptoms that characterized the orphan Merlin; she became pot-bellied, apathetic, and listless and seldom responded to invitations to play. Since she had no elder siblings she moved about on her own for most of the time during the last 2 months of her life. The other mother, Sophie, had a 14-month-old infant; she was "adopted" by her 7-year-old brother, Sniff. He carried her everywhere and even tried to protect her during social excitement. Since she was still almost completely dependent on milk, she lived for only 2 weeks after the death of her mother. Sniff carried her dead body around for about a day.

It is a young and inexperienced sibling (even when this is a male) who adopts an orphan and not, as one might expect, one of the older females. The two infants who were orphaned previously at Gombe were both adopted by older siblings, and it may be significant that they survived their mothers by 1½ and about 2 years, respectively, as compared to the 2 months Circe's infant lived after the mother's death. All these three infants were about the same age when their mothers died.

Interesting in connection with family relationships is the fact that in January 1968 Faben and Figan, Flo's two elder sons, began to travel about together from time to time. Prior to this they had been seen together only when they were with their mother or in some other group. Moreover, during 1968 the two brothers began to spend long hours grooming each other —behavior that had not been seen before. This lends support to our previously held theory that pairs of adult males who travel about together

groom each other and go to each other's aid in times of social difficulty might, in fact, be siblings.

A final point regarding family relationships concerns incest. The oldest-known sons of Flo (Faben and Figan) and of Olly (Evered) were approximately 17, 13, and 14 years of age, respectively. When Flo and Olly were observed during their periods of sexual swelling, none of the young males were ever observed trying to mate with their mothers. Indeed when Flo was at the peak of her swelling, she was once accompanied by 14 physically mature males, including several adolescents younger than Figan. All of these males mated with Flo several times with the exception of her two sons, who were also present in the group.

We do know now that mating between siblings does occur. It was interesting to observe, however, that Fifi, when she first became sexually attractive, consistently either ignored or moved away from her two elder brothers when they directed courtship displays toward her. The first time Figan was observed trying to mate with her she first tried to escape and then, when Figan pursued, screamed loudly throughout copulation. She showed similar behavior during her first mating with Faben. Since then, however, although both brothers have been observed to mate with their sister on other occasions, they have done so markedly less frequently than the other males.

Chimpanzee reproductive behavior study. A major aim of this study is to note the changes in behavior of the female that can be correlated with the different stages of her sexual cycle, and the corresponding changes in her relationships with other individuals. It is becoming increasingly apparent that sexual relationships between a male and a female are not entirely dependent on the presence of a sexual swelling. Thus both Dr. Leakey and Mr. Worzle repeatedly "forced" females to follow them (by threatening and sometimes attacking when they do not do so) even when the females concerned have just lost their swellings. Mr. McGinnis was able to follow one such pair for 6 days and observe in detail the exact nature of the relationship.

Baboon study. Mr. and Mrs. Ransom are doing an excellent study, and their research is yielding a wealth of data, not only on baboon behavior but also on baboon-chimpanzee interactions. The Ransoms were encouraged to work at the Gombe Stream by Dr. Phyllis Dolhinow after her 1966 visit here. We are hoping that their study can be continued on a long-term basis by a succession of students to parallel the chimpanzee research.

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